

WHAT IS CLAIMED IS:

- 1 1. A method for manufacturing a mask for integrated circuit devices, the
2 method comprising:
3 providing a quartz substrate having a surface, the quartz substrate comprising
4 a thickness;
5 forming a MoSi film overlying the surface of the quartz substrate;
6 patterning the MoSi film overlying the quartz substrate to form a mask pattern;
7 and
8 forming an opaque edge structure comprising a carbon bearing material on a
9 portion of the surface around a peripheral region of the mask pattern; whereupon the opaque
10 edge structure has a light transmittance ranging from about 0% to about 3%.
- 1 2. The method of claim 1 wherein the forming of the opaque edge
2 structure is provided by laser deposition.
- 1 3. The method of claim 1 wherein the forming of the opaque edge
2 structure is provided by focused ion beam.
- 1 4. The method of claim 1 wherein the opaque edge structure occupies a
2 region on the quartz substrate that is free from the mask pattern.
- 1 5. The method of claim 1 wherein the mask pattern is for a half tone
2 phase shift mask.
- 1 6. The method of claim 1 further comprising cleaning the patterned MoSi
2 film and opaque edge structure.
- 1 7. The method of claim 1 wherein the carbon is in a C₁₂, C₁₃, C₁₄ state.
- 1 8. The method of claim 1 wherein the patterning of the MoSi film is a
2 photolithography process.
- 1 9. The method of claim 8 wherein the patterning is the only
2 photolithography process used by the method.
- 1 10. The method of claim 1 wherein the mask pattern is free from a chrome
2 film.

1 11. A method for processing integrated circuit devices, the method
2 comprising:
3 providing a mask structure, the mask structure comprising a quartz substrate
4 having a surface, a patterned MoSi film overlying the surface of the quartz substrate to form a
5 mask pattern, and an opaque edge structure comprising a carbon bearing material on a portion
6 of the surface around a peripheral region of the mask pattern; and
7 using the mask structure for applying a pattern onto a photosensitive material
8 overlying a semiconductor substrate.

1 12. The method of claim 11 wherein the mask structure is a mask.

1 13. The method of claim 11 wherein the carbon bearing material is in a
2 C₁₂, C₁₃, C₁₄ state.

1 14. The method of claim 11 wherein the forming of the opaque edge
2 structure is provided by laser deposition.

1 15. The method of claim 11 wherein the forming of the opaque edge
2 structure is provided by focused ion beam.

1 16. The method of claim 11 wherein the opaque edge structure occupies a
2 region on the quartz substrate that is free from the mask pattern.

1 17. The method of claim 11 wherein the mask pattern is for a half tone
2 phase shift mask.

1 18. The method of claim 11 further comprising cleaning the patterned
2 MoSi film and opaque edge structure.

1 19. A half tone phase shift mask for integrated circuit devices, the mask
2 comprising:
3 a substrate having a surface;
4 a patterned light blocking film overlying the surface of the substrate; and
5 an opaque edge structure comprising a carbon bearing material on a portion of
6 the surface around a peripheral region of the mask pattern.

1 20. The mask of claim 19 wherein the carbon bearing material is in a C₁₂,
2 C₁₃, C₁₄ state.